



## Information Technology Division

### **Request:**

In its FY18 budget submission, the Arizona Department of Education (the Department) Information Technology (IT) division is requesting \$17.6 million, which is required to continue development and corresponding support and maintenance of the technological overhaul mandated in 2010. \$7.5 million will allow for the final decommissioning of SAIS, the legacy education data system, provide enhancements to AZDash and extend the technological capabilities of AzEDS to meet the needs of Arizona's educators. \$10.1 million is requested annually, in the baseline, to allow the IT division to employ its nationally-recognized technology approach to the remaining core services the Agency provides to the educational community.

ADE's budget proposal for the IT division is focused on deliverables in the following two areas:

1. Development focused on connecting all of the existing agency functions to the new database structure developed as part of SAIS replacement. A request of \$7.5 million will allow for the final decommissioning of SAIS, the legacy education system, provide enhancements to AZDash and extend the technological capabilities of AzEDS thereby reducing the burden Arizona places on its educators. The development funds will be directed towards connecting and maintaining existing technologies affecting student data and payment, as well as towards emerging technologies that enhance all remaining reporting functions of the Agency. Since the Department is remarkably close to finishing this vital work for the Arizona education community, the requested funds are instrumental in completing all of the innovative work that will bring forth real transformational change in education, as well as a return on its investment for the state.

<b>AELAS Project</b>	<b>Amount</b>	<b>Description</b>
AzEDS	\$2,750,000	Finalize database structure to allow existing web-based services to connect to AELAS and create reporting tools that eliminate redundant data collections
School Finance	\$3,500,000	Complete replacement of manual tools currently used for APOR, CHAR and Annual Budget calculations
AZDash	\$1,250,000	Provide requested educator reports as well as public-facing parent, legislative and post-secondary reports that fuel school choice initiatives

2. An Operational Budget will move the Department closer to the technology industry standard of a 70/30 ratio in regards to funds being dispersed to operations and development. Although it is often neglected, an operational budget ensures technology investments, like that made in AELAS, continue to run smoothly and remain up-to-date technologically. The \$10.1 million requested will allow the IT division to employ its nationally-recognized technology approach to the remaining core services the Agency provides to the educational community. The support and maintenance funds ensure the state's investment continues to



yield savings and efficiencies only available because of the commitment to sound, business technology. Ongoing technology support and maintenance avoids system failure and general disrepair.

Arizona is poised to enter its next phase of the education data system replacement to finally realize the full benefits of its investments in sound technology design and infrastructure. It is simple – all of the work the Department does with, and for, educators must connect to AELAS. Without completing this final horizon, Arizona will have squandered the full potential created by using business technology to serve a public mission. As equally vital, is the unequivocal need to invest in the investment already made by supporting ongoing operations at a sustainable (albeit not industry standard) level. It cannot be stated any more plainly than AELAS' fate will be no different than that of SAIS without proper, ongoing maintenance and support funds.

### Operation Cost

FTEs	60.15 FTE
PERSONAL SERVICES	\$ 4,383,869
ERE	\$ 1,502,061
PROFESSIONAL & OUTSIDE SERVICES	\$ 476,973
TRAVEL	\$ 43,755
OPERATING	\$ 9,816,049
HARDWARE/SOFTWARE	\$ 1,377,293
<b>TOTAL</b>	<b>\$17,600,000</b>

### Background:

In 2010, the Arizona Legislature passed A.R.S. §15-249, Arizona Education Learning and Accountability System (AELAS), to overhaul the state's student data system (SAIS), which was the main technology utilized by the state's education system to acquire and analyze student and LEA data. AELAS was passed to provide all levels of the educational community with the tools and data necessary to support education transformation, academic growth and accountability, while dramatically reducing costs created by the inefficiencies of SAIS.

Based on the recommendations received from the *Information Technology Study* sponsored by the Office of Economic Recovery (OER) and conducted by an independent third-party auditor, WestEd, the Department has successfully addressed several core issues:

- Poor IT leadership with a self-directed staff without clearly-defined objectives.
- Inefficient communication between the Department program areas, LEAs and executive team.
- Obsolete hardware (including network, storage, CPU and memory) that was unsupported and the cause for the Department systems being made unavailable to customers.
- Unreliable system issues with system availability, maintainability and supportability.
- Incorrect (State Longitudinal Data System) SLDS implementation meant that collected data could not be used to support education.



In 2012, a team consulted education stakeholders throughout Arizona to determine what needs would be served by the vision of AELAS. This project resulted in a research paper which documents an approach for developing and deploying education systems and services throughout Arizona that can provide actionable, real-time data to make education decisions, all while reducing hundreds of thousands of wasted man hours on manual and often redundant, data processing.

**The AELAS Business Case research team found that Arizona's districts and charters spend up to \$281,000,000 every year on software maintenance and licensing fees.** It also found that essential educational data was housed in a data warehouse that was so poorly constructed that the data was unable to be extracted for meaningful use. The Department was left with a well-designed data warehouse that relied on manual labor and complex data manipulation but no personnel to provide ongoing support rendering it virtually useless. There were no technology standards in place, resulting in a well-deserved lack of legislative support.

### **Justification:**

Prior to January 2011, technology decisions were made without consulting those who would be using technology – a significant difference from today's culture and leadership. The Department has shifted focus to customer service; ensuring technology is built *for* educators, *by* educators. Before designing technology solutions, the Department consults education stakeholders throughout the state to determine which needs were being served by state education technology, as well as which needs were not.

Once identifying those issues, the agency decided to rectify these inefficiencies by taking a business approach to government problems. Led by *Computersworld* "2014 Premier 100 IT Leaders honoree" and the Department Chief Information Officer (CIO) Mark T. Masterson, the agency empowered LEAs (representing 57 percent of the students statewide) AELAS was created to be more than a technology implementation (technology enables the transformation), since it includes a complete reengineering of cultural and business processes. By listening to the achievements, pain points, wish lists and innovations of LEAs, the team quickly realized the need to improve data quality and system performance. The Department's mission became creating the tools and guidance needed for producing efficient and effective culture and processes in regards to education data that would have financial, education and innovation benefits for the entire state.

This recognition is a result of a thoughtful strategy to employ the best of business practices in a manner that works for both education and government. The Department reached out to industry leaders to evaluate its initial plans. Gartner, Inc., a world-leading information technology research and advisory company, noted that the Department's approach represented a "thorough high-level plan built on best practices." Analysts also noted that they were confident in the agency's ability to deliver because of its strong leadership with experience in managing complex projects.

States throughout the country received upwards of \$250 million to revamp education technology from the federal government – Arizona did not have that luxury. Charged with carrying out the same educational overhaul as other states, instead of \$250 million, Arizona received \$25 million of federal funding to achieve the same results. Beginning as an unfunded state mandate, the Department became financially resourceful. SAIS was stabilized enough to reduce transaction errors by 98.4 percent while providing 99.97 percent availability to LEAs in less than two years. However, this only made SAIS sustainable and its inherent vulnerabilities needed to be replaced.

Below are AELAS's successful education technology initiatives:

1. **ADEConnect:** ADEConnect provided one secure, single login per user that allows access to the Department's reporting tools. It provides educators secure one-click access thru the classroom management



tools they already use. ADEConnect replaces Common Logon, an outdated identification system that requires users to maintain multiple passwords making auditable and accurate user authentication impossible.

2. **AZDash:** After the success of developing ADEConnect, the Department began focusing its efforts on making available the federally-funded AZDash dashboards to every educator in the state. AZDash consolidates and presents student performance data in easy-to-use web screens and reports – teachers now have information about students entering their classroom that previously was only able to be gathered through combing through dozens of individual student paper files.

Before AELAS, the Department found that a high-performing teacher often took 5-7 days to gather important information on incoming students. However, once the Department made the connection between student, teacher and course, years of data became immediately available with a few clicks – returning tens of thousands of hours to over 60,000 teachers in nearly 2,200 public schools in Arizona. Those hours now could be used acting upon the data rather than collecting it.

The technology that the dashboards were built on received national recognition by being named “Top 3 public-facing websites” in the US by the Education Commission of the States in May 2014. Since then, AZDash has incorporated AZMerit assessment results, Early Childhood and AZELLA information to create an even more well-rounded view into students in the classroom. Now, educators not only can analyze how they could improve on the previous year, but they can also plan ahead by examining the strengths and weaknesses of the next group of students.

3. **SSIS (Statewide Student Information System):** Another application within AELAS, the Statewide Student Information System (SSIS), allows the Department to normalize per student costs for the LEAs that opt in to the state contract. Before the introduction of SSIS to LEAs, more than two-thirds of districts and charters paid between \$18 and \$57 per student for this system. However, the state contract offers this system for \$12.50 per student before dropping down to \$7.50 per student (\$6.50 for current customers). The idea was that the smaller and less financially-capable LEAs, who are paying more than the larger and more prosperous districts, will receive the same level of service and technology.

After partnering with Edupoint and their Synergy student information system, SSIS went live in 2015. In its first year of availability, the Department doubled its goal of signing up 25 LEAs to opt in to SSIS by enlisting 50 LEAs. SSIS saved LEAs an average of \$3.59 per student, an amount that totals to nearly \$1 million estimated savings to the 50+ LEAs participating in the program.

4. **AzEDS (Arizona Education Data Standards):** One of the most important components of AELAS is the replacement of SAIS. As the legislative appropriations have not totaled the Agency request, the Information Technology division has prioritized its SAIS replacement efforts to first focus on the Student database portion. This approach allows the Department to leverage the student details collected in AzEDS (and used for state aid payment calculations in SAIS) to provide the needed data for the dozens of other mandated reports and services. Future development work for AzEDS builds on this foundation and is a way to reduce, if not eliminate, millions of technology dollars spent on collecting data in pieces and parts rather than using business-tested approaches like used to collect student data for state aid payments.

In July of 2016, AzEDS replaced SAIS as the student data system of record, effectively replacing SAIS to external partners. Whereas SAIS took a week to run integrity and aggregation, AzEDS can provide LEAs their ADM on any given day. This allows LEAs to better configure their budgets and make more informed financial decisions.



The rolling out of AzEDS is one of the reasons the Department's Information Technology division was named one of *CIO* magazine's "Top 100 Most Innovative IT Organizations" for creating business value in the world last year. It is also the main reason why Mark Masterson was featured as the keynote speaker at Mississippi's top education conference this past June.

5. **School Finance enhancements:** The ingenuity behind the design of AzEDS was not only in its ability to collect student information, but also process financial data. The intellectual property behind the applications is also one of the ways the Arizona Legislature may be able to help recoup their investment in all of these technologies.

In the past three years, the \$3.3 million invested in School Finance upgrades has resulted in decommissioning more than 20 manual processes and reducing processing time from weeks to hours (greater than an 80 percent reduction). Significant work remains in redesigning the payment processes that calculate state aid payments for districts and charters.

AELAS development is on the precipice of completion. The lack of funding for maintenance and support has slowed development for the past four years. In the early years of AELAS development, there was not a need to include maintenance support funds because there were not new functioning systems. As new systems became available, the Department included requests for maintenance to ensure newly developed tools were working, available and functioning for educators throughout Arizona. Year over year, the Department has received its full development request, nor its maintenance and support funding request. These requests are built based on what work could be accomplished and supported annually – the chronic underfunding of both development and maintenance has added to AELAS's overall costs.

The main portion of SAIS replacement, the way student information is collected, managed and stored, has been completed, leaving the connections to the dozens of existing web-based tools to be completed. There is also significant work that needs to be done to integrate and upgrade the databases that manage teacher data as well as databases that collect and store data related to school site type, location and other attributes associated with LEAs physical location. These critical databases are tied to the Department's mandated reports. Not only are these systems woefully out of date technologically, they are incompatible with the newly developed AELAS infrastructure. The Department's plan has always called for this final work to be completed – the focus on SAIS replacement has rightfully taken top priority in the early years of the program. To that end, major work to reengineer the technology that processes state aid payments remains. These functions remain on the outdated, unsupported technology housed in SAIS. All of the investment in AELAS to date will be wasted should the state decide not to fund completion of this reengineering.

ADE anticipates \$18.75 million over the next three fiscal years to finalize the full vision of AELAS, assuming maintenance and support receives adequate support. Otherwise, the Department will need to further slow development by using AELAS appropriations for this critical work.

### **Maintenance and Support**

As noted, everything the Department is mandated to do is fueled by the infrastructure created by AELAS. The Department's IT division was recognized by the Reform Support Network in March 2014 as an agency success story, and its conceptual architecture was provided as a model for other state education agencies (SEAs). This architecture is the foundation for fundamental change for the Department in all technology areas.

Additionally, the Department was recognized by CITEworld, a leading source for IT professionals for information and resources on how to bring innovative technology solutions to customers. The awards program spotlights



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leading organizations for their cutting-edge use of consumer-inspired technology in one of six award categories. The Department was actually named a finalist in the Best Smart Data Project category for its work on AZDash.

By drawing upon its ability to collaborate with educators, consult its stakeholders, implement their recommendations, construct a team of industry experts, create best-in-class technology solutions, leverage multiple funding sources, resourcefully use underutilized technology and creatively stretch its invested capital, the Department IT has taken many giant leaps forward in transforming education technology. The Department and the Arizona State Legislature have worked together to create a statewide system of data collection, analysis and access tools that will enable everyone – from parents to policymakers – to make educational decisions based on accurate and timely information.

With these new tools available to educators and stakeholders at low to zero cost, the final chapter is connecting them together and ensure that they are maintained properly. AzEDS can now feed hundreds of mandated reports; however, it only supplies a portion of the data needed. The Department continues to needlessly create and maintain other means to collect and store the needed information. The technology exists to extend the underlying infrastructure to accomplish these very easily attainable objectives. Investing in innovation, along with appropriate support, is a critical component.

Continuing to build off of the best-in-class architecture to finish the School Finance portion of AzEDS will make Arizona the model financial system for SEAs nationwide. By developing AzEDS a step further, the Department's IT division will be able to communicate properly with the LEAs' student information systems and remove the administrative work of reporting out for them. The same would be done internally, with the Department's program areas all syncing and connecting to a single source of data storage, creating limitless time savings for those departments. Critical investment in appropriate support staff in other the Department functional areas is also required. AzEDS has fundamentally changed the way Arizona collects student data and processes it for state aid payments and mandated reporting. Additional support, beyond that of solely technical expertise, is included in the Department's overall maintenance and support funding request.

Maintenance/Support Activity	Amount	Source Prior to AELAS
Hardware/Software needs	\$1,150,000	Program Areas
AzEDS Support	\$775,000	Prop 301 SAIS Support
Program Support Office	\$750,000	None
AZDash	\$750,000	None
AELAS Network Operations	\$730,000	None
ADEConnect	\$700,000	None
ADE Support Center	\$475,000	Prop 301 SAIS Support
AELAS Strategic Oversight	\$320,000	None
School Finance Support	\$200,000	Prop 301 SAIS Support



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ADE Network Operations	\$1,008,695	Program Areas
Data and State Aid Payments Support	\$125,167	None
ADE Agency Desktop Support	\$949,688	Program Areas
ADE Federal Reporting Application	\$100,000	Program Areas
IT General Fund	\$1,683,450	Agency Baseline
Database Migrations	\$383,000	None
<b>Total</b>	<b>\$10,100,000</b>	

AELAS has benefited from strict and careful oversight from the Department of Administration's Strategic Oversight Division (ASET). This partnership ensures that development is completed at an appropriate pace and scale for success. The Department anticipates this oversight to continue to yield benefits, as it is under their guidance that maintenance and support funds have remained a priority investment. This sound approach is not without its drawbacks – each year support is not funded, development of full system capabilities is delayed.

Fiscal Year	Operations Support Request	Total AELAS Development Request	Operations Support Appropriation	Operations Support Budget	Operations Support Expenditure	Total AELAS Appropriation
<b>2013</b>	\$0	\$0	\$0	\$0	\$795,142	\$6,200,000
<b>2014</b>	\$1,000,000	\$0	\$0	\$1,000,000	\$724,012	\$7,000,000
<b>2015</b>	\$3,700,000	\$16,200,000	\$0	\$3,300,000	\$2,724,601	\$12,000,000
<b>2016</b>	\$4,500,000	\$15,500,000	\$0	\$1,900,000	\$3,514,652	\$7,000,000
<b>2017</b>	\$4,175,000	\$11,475,000	\$0	\$3,260,000		\$7,300,000
<b>Total</b>	<b>\$13,375,000</b>	<b>\$43,175,000</b>	<b>\$0</b>	<b>\$9,460,000</b>	<b>\$7,758,407</b>	<b>\$38,300,000</b>

Additionally, the quarterly monitoring site visits from the WestEd/CELIT team routinely uncover areas for improvement in design and deployment. They have been instrumental in devising the Department's data governance program and providing insight into national best practices. The Data Governance Commission and the State Board of Education also perform critical oversight duties. These measures have allowed the Department to improve its design and delivery while giving a greater level of assurance to the tax paying public that the funds invested in AELAS are used to their maximum potential.

ASET's renewed efforts to review and consolidate state technology projects has had a positive impact on AELAS development. Every major effort has required a Project Investment Justification document and its corresponding monthly monitoring for milestones and achievements. This process allows the Department to quickly identify potential impediments to successful delivery and immediately devise a mitigation plan. Employing this sound approach to technology development, like that used in private industry, keeps in line with the Department's overall development philosophy. A key component of private industry's philosophy is to include appropriate funding for maintenance and support. The State's most recent large-scale payment and accounting system (AFIS) employs this methodology in that it collects \$1.00+ per transaction to recoup the state's investment in developing the technology



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and ongoing maintenance and support. The Department requests this sound approach be replicated with AELAS, a system that processes more than \$6.0 billion in state and federal payments annually.

The Department's commitment to sound business practices continues to garner national interest. The Intellectual Property legislation enacted in the 2016 Legislative Session opens Arizona to new opportunities to recoup its investment in AELAS. As noted, other states have received upwards of \$250 million to develop educational data systems like that of AELAS. These same states are now approaching the Department to procure its intellectual capital. Further investments in completing AELAS development have the potential to pay for themselves in the future. Many states have adopted the same underlying technology principles as Arizona but have yet to make the same advancements in their systems. Arizona stands to lose its market advantage as well as its ability to achieve a direct return on its investment in AELAS (in addition to the millions in savings to LEAs every year).

ADE has made good use of the funds invested in AELAS thus far, building a system that is adaptable to future legislative changes and evolving technology. While the technology exists to incorporate changes, it requires an ongoing, dedicated funding source to implement enhancements to the core system. The state has yet to scratch the surface of its full capabilities – a technology system as robust as AELAS has the potential to remove tens of thousands of man hours spent in LEAs collecting and submitting redundant data. This translates into millions of dollars spent on administrative overhead and diverted from classrooms, year over year. Investment in the final components of AELAS, those tying the databases used for state aid payments to the dozens of other the Department mandated data collections, finally creates the full view picture of LEA and student performance the state so desperately needs. Not only useful for government agencies, this full view creates a true picture of LEA and student accountability that business and commerce needs to keep Arizona competitive nationally and globally.